PATENT ABSTRACTS OF JAPAN

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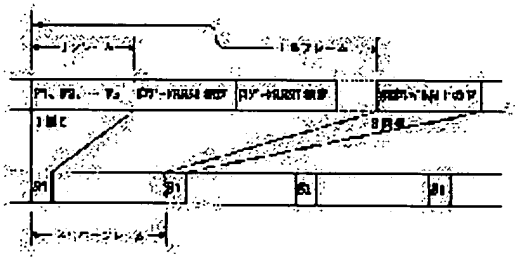
(54) SWITCHING METHOD FOR BASE STATION OF MOBILE COMMUNICATION SYSTEM

(57)Abstract:

PROBLEM TO BE SOLVED: To provide stable communication with less fluctuation of a reception signal level by executing the measuring processing in second and subsequent measuring periods only from a base station where a value measured in the first measuring period among plural measuring periods shows over specified electric field intensity and selecting the base station whose electric field intensity is maximum as a next switching candidate base station.



SOLUTION: The reception signal level Li (i-1, 2,..., n) from all the base stations of monitoring control channel numbers F1, F2,..., Fn measured in the first measuring period are compared with the reception signal level L from the base station during communication at present. The reception signal levels are measured (F over a specified level) by selecting only the monitoring control channel numbers satisfying the condition of L<Li as objects. Thus, the number of the monitoring control channels which are made to be the measuring objects of the reception signal level in the second and subsequent measuring periods can be reduced compared to the number (n) of the base stations and time required for selecting the base station is shortened.

LEGAL STATUS

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CLAIMS

[Claim(s)]
[Claim 1] Have two or more base stations and predetermined carries out count activation of plurality of the measurement of the field strength of all the base stations in a mobile station as 1 time of a measurement period. In the base station change-over approach in the migration communication system of the method which continues a change and the communication link of a mobile station for the base station which serves as the communications-partner point according to this measurement result The measurement processing in the measurement period after 2 times among the measurement periods of said multiple times The base station change-over approach of the migration communication system characterized by performing only about the base station which showed more than field strength predetermined in the field strength measured in 1 time of the first measurement period, consequently field strength selecting the greatest base station as a next change-over candidate base station.
[Claim 2] Have two or more base stations and predetermined carries out count activation of plurality of the measurement of the field strength of all the base stations in a mobile station as 1 time of a measurement period. In the base station change-over approach in the migration communication system of the method which continues a change and the communication link of a mobile station for the base station which serves as the communications-partner point according to this measurement result The base station change-over approach of the migration communication system characterized by field strength selecting the greatest base station as a next change-over candidate base station among the base stations as for which field strength level is carrying out the simple increment as a result of the measurement processing in the measurement period of said multiple times.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention prepares two or more base stations, relates to the migration communication system which continued the communication link by switching the base station which serves as a communications partner with a mobile station, and relates to the selection approach of the base station which serves as the next change-over candidate especially.
[0002]
[Description of the Prior Art] It is necessary to make a communication link possible certainly under complicated radio-wave-propagation circumstances, two or more base stations are prepared as one method for it, and the migration communication system of the method which switches the base station used as a communications partner at any time according to change of the field strength by the location of a mobile station etc., and continues a communication link is known for migration communication system from the former.
[0003] Drawing 3 is what showed this conventional migration communication system, and arranges base stations 2-4 and a control station 5 beforehand like illustration supposing the successive range of a mobile station 1. A mobile station 1 The communications area A2 by these base stations 2-4, A3, and A4 When it is in any they are, The communication link is made to be continued by communicating with a corresponding base station and switching from one communications area to the communications area of another side in the part which each communications area overlaps, and the part which adjoins.
[0004] Here, in this drawing 3 , a mobile station 1 is the communications area A2 of a base station 2. It is this communications area A2, communicating through this base station 2 inside. In order to show the condition of having reached the zone periphery, therefore to make a communication link continue, it is necessary to switch a communications partner to an adjoining base station 3 or an adjoining base station 4 here. Then, for this reason, as a mobile station 1 is the following, it switches the base station which serves as a change and a communications partner in a channel.
[0005] It carries out the firm measurement of the received field strength of a there, using the mobile station 1 under communication link as RSSI. Namely, like illustration Communications area A2 Reach a zone periphery and the received field strength RSSI falls. Predetermined change-over judging level Lth to which this is set beforehand It becomes below, and the condition also judges this first to be level degradation, when [which is predetermined / which it has set up beforehand] it continues one or more [fixed time amount T] and carries out.
[0006] Next, a mobile station 1 performs the following processings as circumference zone monitor processing by having judged with this level degradation. Namely, the control channel numbers F1 and F2 for a monitor, ... which are reported by the system information transmitted from each base station, Based on Fn (the number of n= base stations), it equalizes by performing m predetermined counts and the level measurement of an input signal which are similarly reported, and the base station of the communications area which showed the highest received signal level is chosen as a next change-over candidate base station. Next, The received signal level Lmax Received signal level L by the base station

under current communication link is compared, and it is received signal level Lmax. When the direction becomes larger than received signal level L, That is, when it becomes Lmax>L, the channel change-over to the base station of the communications area is started.

[0007]

[Problem(s) to be Solved by the Invention] Consideration was not carried out about the point that selection of the base station which serves as a change-over candidate next takes most time amount, but the above-mentioned conventional technique had the problem that there was a possibility that a change-over of a base station may change signal level at the time of delay and a change-over. Moreover, with the conventional technique, there is no guarantee that selection of the base station which serves as a change-over [degree] candidate is not necessarily obtained appropriately, and there was a problem that the change of a base station will be needed depending on the migration direction of a mobile station, again for a short time. It is as follows when it explains in more detail about these problems.

[0008] Specifically, detection of the received signal level in the above-mentioned circumference zone monitor processing is performed using the frame S1 set up on the super frame which consists of a multiple frame, as shown in drawing 2 . And this level detection processing is performed over m times of the measurement counts specified by system information, and the average is calculated.

[0009] By the way, in this drawing 2 , the transmission rates in public business use digital migration communication system are 40mS(s)/a frame, since 1 super frame consists of 18 frames, the time amount of 1 super frame is 720mS(s), and the time amount of a frame S1 is 40mS(s).

[0010] Then, it becomes a limit to detect warm-up time in hardware, such as time amount to the lock in of the frequency synthesizer circuit included in the communication circuit, and time amount required for level detection about four base stations by minimum within 10mS(s), then the period of the frame S1 within 1 super frame. Therefore, although level detection of all base stations can be performed within the period of the frame S1 within 1 super frame as shown in drawing 2 when the several n (= the number of base stations) control channel for a monitor is four or less When the several n (the number of = base stations) control channel for a monitor exceeds 4 n/4 time as much detection time, i.e., the detection time of mS (n / 4x720), as time amount detectable in 1 super frame period is needed, as 1 time of a measurement period, m period measurement must be performed and this must be equalized.

[0011] In addition, when several n of a base station is five or more for this reason, 1 time of a measurement period increases by 1 super frame, whenever n exceeds 4 and exceeds the multiple of further 4, 1 time of a measurement period turns into 2 super frame period at the time of n=5-8, and 1 time of a measurement period turns into 3 super frame period at the time of n=9-12.

[0012] So, in the above-mentioned public business use Since the maximum of the several n base station in one system is determined as 20, it is referred to as n= 20. About a measurement count m m= 3, then time amount required for selection of a next candidate base station Deterioration of the communication link quality of time amount after it has been 20/4x720mSx3= 10.8 seconds, therefore a received signal level falls as long as these 10.8 seconds with the conventional technique until it switches to a next candidate base station changing delay and a received signal level will arise.

[0013] moreover, it is shown in drawing 3 at this time -- as -- a mobile station 1 -- communications area A2 from -- communications area A3 a circumference zone -- going -- communications area A4 It is supposed that it moved for a short time. By the circumstances at this time Communications area A3 The direction of a received signal level is communications area A4. Even when it is smaller than a received signal level, supposing it is high, with the above-mentioned conventional technique communications area A2 from -- once -- communications area A3 the short time after switching -- communications area A4 It will keep as a change-over, therefore the problem that the change of a base station will be needed will arise again with the conventional technique for a short time.

[0014] First, the 1st purpose of this invention has little fluctuation of the received signal level accompanying a change-over of a base station, and offering the base station change-over approach of the migration communication system obtained easily has the stable communication link. Moreover, the 2nd purpose of this invention is to offer the base station change-over approach of migration communication system that the change-over frequency of the base station accompanying migration of a mobile station

was stopped.
[0015]
[Means for Solving the Problem] First, the 1st purpose of above-mentioned this invention is equipped with two or more base stations, and predetermined carries out count activation of plurality of the measurement of the field strength of all the base stations in a mobile station as 1 time of a measurement period. In the base station change-over approach in the migration communication system of the method which continues a change and the communication link of a mobile station for the base station which serves as the communications-partner point according to this measurement result The measurement processing in the measurement period after 2 times among the measurement periods of said multiple times It performs only about the base station which showed more than field strength predetermined in the field strength measured in 1 time of the first measurement period, consequently as field strength selects the greatest base station as a next change-over candidate base station, it is attained.
[0016] Next, the 2nd purpose of above-mentioned this invention is equipped with two or more base stations, and predetermined carries out count activation of plurality of the measurement of the field strength of all the base stations in a mobile station as 1 time of a measurement period. In the base station change-over approach in the migration communication system of the method which continues a change and the communication link of a mobile station for the base station which serves as the communications-partner point according to this measurement result As a result of the measurement processing in the measurement period of said multiple times, among the base stations which are carrying out the simple increment, field strength level is attained, as field strength selects the greatest base station as a next change-over candidate base station.
[0017]
[Embodiment of the Invention] Hereafter, the operation gestalt of illustration explains the base station change-over approach of the migration communication system by this invention to a detail. First, an example of the migration communication system with which 1 operation gestalt of this invention was applied is the same as the system of drawing 3 explained with the conventional technique. Therefore, they are the communications area A2 have base stations 2-4 and a control station 5, and according [a mobile station 1] to these base stations 2-4, A3, and A4. When it is in any they are, the point that communicate with a corresponding base station, are the part which each communications area overlaps, and the part which the communications area adjoins, switch to the communications area of another side from one communications area, and a communication link is continued is the same as the conventional technique.
[0018] Furthermore, for this reason, it carries out the firm measurement of the received field strength of a there, using the mobile station 1 under communication link as RSSI. Predetermined change-over judging level Lth to which this received field strength RSSI is set beforehand When it became below, and that condition continues one or more [time amount T] and carries out, The point of judging with level degradation, this progressing to circumference zone monitor processing, and this selecting the base station which serves as the next change-over candidate, and starting a channel change-over is the same as the conventional technique.
[0019] The conventional techniques differ greatly, therefore the contents of the received signal level detection processing in circumference zone monitor processing which are selection processing of the base station which serves as the next change-over candidate with the operation gestalt of this invention which carries out a deer, and which is explained here explain the received signal level detection processing by the operation gestalt of this this invention by drawing 1 hereafter. First, in drawing 1 , the processing in 1st 1 super frame period is the same as the case of the conventional technique explained by drawing 3 , and measures each received signal level by all the base stations of the control channel numbers F1, F2, ..., Fn for a monitor. Therefore, when a several n base station is five or more, the same is said of the point that the processing in two or more super frame periods which responded to the numeric value of n becomes 1 time of a measurement period.
[0020] By the way, with the conventional technique, also in each measurement period of the 2nd henceforth, it is the same as the processing in the 1st measurement period altogether, and the received

signal level of each base station expressed by the control channel numbers F1, F2, ..., Fn for a monitor is all measured. However, the operation gestalt of this invention first compares with received signal level L by the base station under current communication link each received signal level Li (i= 1, 2, .., n) by all the base stations of the control channel numbers F1, F2, ..., Fn for a monitor measured in the 1st measurement period here.

[0021] And measurement processing of each of those received signal levels is performed only for the control channel number for a monitor which had satisfied the conditions of "L<Li" here. In addition, the thing of measurement processing of the received signal level only about the control channel number for a monitor with which were satisfied of this "L<Li" is indicated to be "F more than convention level" by drawing 1 .

[0022] Therefore, according to this operation gestalt, the time amount which selection of the base station which can make it fewer than number n of games of a base station, consequently then serves as a change-over candidate takes the number of the control channels for a monitor which must be made into the measuring object of a received signal level in the measurement period of the 2nd henceforth can be shortened certainly, and can fully suppress fluctuation of the signal level accompanying a change-over of a base station.

[0023] It is the mobile station which is generally in a certain communications area with such migration communication system among the received signal levels from the base station which has n games, and the number of the base stations which show a received signal level higher than received signal level L by the base station under present communication link is [which adjoin the communications area by the base station under present communication link] 2 or 3 so that clearly also from drawing 3 .

[0024] Consequently, when several n of a base station is 20 like the communication system of public business use described above, for example according to the operation gestalt of this invention, in the measurement period of the 2nd henceforth, the time amount which selection of the base station which the number for a monitor of control channels is set to at most 3 from 20, therefore then serves as a change-over candidate takes can fully be shortened.

[0025] Next, other operation gestalten of this invention are explained. First, also in other operation gestalten of this this invention, the point of progressing to circumference zone monitor processing, and this selecting the base station which serves as the next change-over candidate, and starting a channel change-over by migration of the mobile station under communication link etc. is the same as the conventional technique explained by drawing 2 . The point that carry out a deer and other operation gestalten differ from the above-mentioned conventional technique is in the contents of the processing which selects the base station which serves as the next change-over candidate from the received signal level of each base station which equalized by processing in a measurement period and was obtained.

[0026] First, with the conventional technique, as already explained, the received signal level of each base station which equalized by processing in a measurement period and was obtained was seen, and the base station of the communications area which showed the highest received signal level is chosen as a next change-over candidate base station.

[0027] On the other hand, with other operation gestalten of this this invention, only the base station as for which field strength level, i.e., a received signal level, is carrying out the simple increment is selected, and, subsequently field strength selects the greatest base station from the measurement processing result in the measurement period of multiple times as a next change-over candidate base station in them.

[0028] with such migration communication system, drawing 3 already explained -- as -- a mobile station 1 -- communications area A2 from -- communications area A3 a circumference zone -- going -- communications area A4 a short time -- moving -- the circumstances at this time -- communications area A3 the direction of a received signal level -- communications area A4 It may become higher than a received signal level.

[0029] in this case -- since only the size of a received signal level is seen with the conventional technique -- communications area A2 from -- once -- communications area A3 the short time after switching -- communications area A4 It will keep as a change-over, therefore, the way things stand, the

change of a base station is needed again for a short time, and there is a possibility that a change-over of the base station accompanying migration of a mobile station may take place frequently.
[0030] By the way, it is drawing 3 , for example, the case where the mobile station 1 is moving in the direction of arrow-head P is assumed, and it is communications area A3 in this time. Circumstances and communications area A4 of change of a received signal level It is as follows when it sees about the circumstances of change of a received signal level. first, communications area A3 **** -- the migration direction of a mobile station 1 -- this communications area A3 from -- since it has become in the direction from which it separates, the received signal level by it should show a downward tendency -- it comes out.
[0031] On the other hand, it is communications area A4. Since it has become in the direction which the migration direction of a mobile station 1 enters into it then, and dies, the received signal level by it should show the upward tendency. Then, supposing it selects only the base station as for which the received signal level is carrying out the simple increment at this time, it is communications area A4 in this case. A base station 4, i.e., a base station, is selected. And further, in the base station as for which the received signal level is carrying out the simple increment, supposing a received signal level selects the greatest base station, it will become a base station 4 in this case.
[0032] With other operation gestalten of above-mentioned this invention, only the base station as for which the received signal level is carrying out the simple increment is selected here. Subsequently Since field strength has selected the greatest base station as a next change-over candidate base station in them, for example in the case of this drawing 3 communications area A2 from -- once -- communications area A3 without it switches -- communications area A2 from -- immediately -- communications area A4 It will be switched, therefore a change-over of the unnecessary base station accompanying migration of a mobile station can fully be suppressed.
[0033]
[Effect of the Invention] Since the time amount which selection of the mobile station which serves as the next change-over candidate takes can be shortened according to this invention, a change-over of a base station can be managed in a short time, therefore there can be little fluctuation of the received signal level accompanying this change-over, and the stable communication link can be obtained easily. Moreover, since selection of the mobile station which serves as the next change-over candidate is obtained appropriately according to this invention, the change-over frequency of the base station accompanying migration of a mobile station is stopped, and the stable communication link can be obtained easily.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] This invention prepares two or more base stations, relates to the migration communication system which continued the communication link by switching the base station which serves as a communications partner with a mobile station, and relates to the selection approach of the base station which serves as the next change-over candidate especially.

[Translation done.]

PRIOR ART

[Description of the Prior Art] It is necessary to make a communication link possible certainly under complicated radio-wave-propagation circumstances, two or more base stations are prepared as one method for it, and the migration communication system of the method which switches the base station used as a communications partner at any time according to change of the field strength by the location of a mobile station etc., and continues a communication link is known for migration communication system from the former.
[0003] Drawing 3 is what showed this conventional migration communication system, and arranges base stations 2-4 and a control station 5 beforehand like illustration supposing the successive range of a mobile station 1. A mobile station 1 The communications area A2 by these base stations 2-4, A3, and A4 When it is in any they are, The communication link is made to be continued by communicating with a corresponding base station and switching from one communications area to the communications area of another side in the part which each communications area overlaps, and the part which adjoins.
[0004] Here, in this drawing 3 , a mobile station 1 is the communications area A2 of a base station 2. It is this communications area A2, communicating through this base station 2 inside. In order to show the condition of having reached the zone periphery, therefore to make a communication link continue, it is necessary to switch a communications partner to an adjoining base station 3 or an adjoining base station 4 here. Then, for this reason, as a mobile station 1 is the following, it switches the base station which serves as a change and a communications partner in a channel.
[0005] It carries out the firm measurement of the received field strength of a there, using the mobile station 1 under communication link as RSSI. Namely, like illustration Communications area A2 Reach a zone periphery and the received field strength RSSI falls. Predetermined change-over judging level Lth to which this is set beforehand It becomes below, and the condition also judges this first to be level degradation, when [which is predetermined / which it has set up beforehand] it continues one or more [fixed time amount T] and carries out.
[0006] Next, a mobile station 1 performs the following processings as circumference zone monitor processing by having judged with this level degradation. Namely, the control channel numbers F1 and F2 for a monitor, ... which are reported by the system information transmitted from each base station, Based on Fn (the number of n= base stations), it equalizes by performing m predetermined counts and the level measurement of an input signal which are similarly reported, and the base station of the communications area which showed the highest received signal level is chosen as a next change-over candidate base station. Next, The received signal level Lmax Received signal level L by the base station under current communication link is compared, and it is received signal level Lmax. When the direction becomes larger than received signal level L, That is, when it becomes Lmax>L, the channel change-over to the base station of the communications area is started.

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EFFECT OF THE INVENTION

[Effect of the Invention] Since the time amount which selection of the mobile station which serves as the next change-over candidate takes can be shortened according to this invention, a change-over of a base station can be managed in a short time, therefore there can be little fluctuation of the received signal level accompanying this change-over, and the stable communication link can be obtained easily. Moreover, since selection of the mobile station which serves as the next change-over candidate is obtained appropriately according to this invention, the change-over frequency of the base station accompanying migration of a mobile station is stopped, and the stable communication link can be obtained easily.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Consideration was not carried out about the point that selection of the base station which serves as a change-over candidate next takes most time amount, but the above-mentioned conventional technique had the problem that there was a possibility that a change-over of a base station may change signal level at the time of delay and a change-over. Moreover, with the conventional technique, there is no guarantee that selection of the base station which serves as a change-over [degree] candidate is not necessarily obtained appropriately, and there was a problem that the change of a base station will be needed depending on the migration direction of a mobile station, again for a short time. It is as follows when it explains in more detail about these problems.
[0008] Specifically, detection of the received signal level in the above-mentioned circumference zone monitor processing is performed using the frame S1 set up on the super frame which consists of a multiple frame, as shown in drawing 2 . And this level detection processing is performed over m times of the measurement counts specified by system information, and the average is calculated.
[0009] By the way, in this drawing 2 , the transmission rates in public business use digital migration communication system are 40mS(s)/a frame, since 1 super frame consists of 18 frames, the time amount of 1 super frame is 720mS(s), and the time amount of a frame S1 is 40mS(s).
[0010] Then, it becomes a limit to detect warm-up time in hardware, such as time amount to the lock in of the frequency synthesizer circuit included in the communication circuit, and time amount required for level detection about four base stations by minimum within 10mS(s), then the period of the frame S1 within 1 super frame. Therefore, although level detection of all base stations can be performed within the period of the frame S1 within 1 super frame as shown in drawing 2 when the several n (= the number of base stations) control channel for a monitor is four or less When the several n (the number of = base stations) control channel for a monitor exceeds 4 n/4 time as much detection time, i.e., the detection time of mS (n / 4x720), as time amount detectable in 1 super frame period is needed, as 1 time of a measurement period, m period measurement must be performed and this must be equalized.
[0011] In addition, when several n of a base station is five or more for this reason, 1 time of a measurement period increases by 1 super frame, whenever n exceeds 4 and exceeds the multiple of further 4, 1 time of a measurement period turns into 2 super frame period at the time of n=5-8, and 1 time of a measurement period turns into 3 super frame period at the time of n=9-12.
[0012] So, in the above-mentioned public business use Since the maximum of the several n base station in one system is determined as 20, it is referred to as n= 20. About a measurement count m m= 3, then time amount required for selection of a next candidate base station Deterioration of the communication link quality of time amount after it has been 20/4x720mSx3= 10.8 seconds, therefore a received signal level falls as long as these 10.8 seconds with the conventional technique until it switches to a next candidate base station changing delay and a received signal level will arise.
[0013] moreover, it is shown in drawing 3 at this time -- as -- a mobile station 1 -- communications area A2 from -- communications area A3 a circumference zone -- going -- communications area A4 It is supposed that it moved for a short time. By the circumstances at this time Communications area A3 The direction of a received signal level is communications area A4. Even when it is smaller than a received

signal level, supposing it is high, with the above-mentioned conventional technique communications area A2 from -- once -- communications area A3 the short time after switching -- communications area A4 It will keep as a change-over, therefore the problem that the change of a base station will be needed will arise again with the conventional technique for a short time.

[0014] First, the 1st purpose of this invention has little fluctuation of the received signal level accompanying a change-over of a base station, and offering the base station change-over approach of the migration communication system obtained easily has the stable communication link. Moreover, the 2nd purpose of this invention is to offer the base station change-over approach of migration communication system that the change-over frequency of the base station accompanying migration of a mobile station was stopped.

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MEANS

[Means for Solving the Problem] First, the 1st purpose of above-mentioned this invention is equipped with two or more base stations, and predetermined carries out count activation of plurality of the measurement of the field strength of all the base stations in a mobile station as 1 time of a measurement period. In the base station change-over approach in the migration communication system of the method which continues a change and the communication link of a mobile station for the base station which serves as the communications-partner point according to this measurement result The measurement processing in the measurement period after 2 times among the measurement periods of said multiple times It performs only about the base station which showed more than field strength predetermined in the field strength measured in 1 time of the first measurement period, consequently as field strength selects the greatest base station as a next change-over candidate base station, it is attained.
[0016] Next, the 2nd purpose of above-mentioned this invention is equipped with two or more base stations, and predetermined carries out count activation of plurality of the measurement of the field strength of all the base stations in a mobile station as 1 time of a measurement period. In the base station change-over approach in the migration communication system of the method which continues a change and the communication link of a mobile station for the base station which serves as the communications-partner point according to this measurement result As a result of the measurement processing in the measurement period of said multiple times, among the base stations which are carrying out the simple increment, field strength level is attained, as field strength selects the greatest base station as a next change-over candidate base station.
[0017]
[Embodiment of the Invention] Hereafter, the operation gestalt of illustration explains the base station change-over approach of the migration communication system by this invention to a detail. First, an example of the migration communication system with which 1 operation gestalt of this invention was applied is the same as the system of drawing 3 explained with the conventional technique. Therefore, they are the communications area A2 have base stations 2-4 and a control station 5, and according [a mobile station 1] to these base stations 2-4, A3, and A4. When it is in any they are, the point that communicate with a corresponding base station, are the part which each communications area overlaps, and the part which the communications area adjoins, switch to the communications area of another side from one communications area, and a communication link is continued is the same as the conventional technique.
[0018] Furthermore, for this reason, it carries out the firm measurement of the received field strength of a there, using the mobile station 1 under communication link as RSSI. Predetermined change-over judging level Lth to which this received field strength RSSI is set beforehand When it became below, and that condition continues one or more [time amount T] and carries out, The point of judging with level degradation, this progressing to circumference zone monitor processing, and this selecting the base station which serves as the next change-over candidate, and starting a channel change-over is the same as the conventional technique.
[0019] The conventional techniques differ greatly, therefore the contents of the received signal level

detection processing in circumference zone monitor processing which are selection processing of the base station which serves as the next change-over candidate with the operation gestalt of this invention which carries out a deer, and which is explained here explain the received signal level detection processing by the operation gestalt of this this invention by drawing 1 hereafter. First, in drawing 1 , the processing in 1st 1 super frame period is the same as the case of the conventional technique explained by drawing 3 , and measures each received signal level by all the base stations of the control channel numbers F1, F2, ..., Fn for a monitor. Therefore, when a several n base station is five or more, the same is said of the point that the processing in two or more super frame periods which responded to the numeric value of n becomes 1 time of a measurement period.

[0020] By the way, with the conventional technique, also in each measurement period of the 2nd henceforth, it is the same as the processing in the 1st measurement period altogether, and the received signal level of each base station expressed by the control channel numbers F1, F2, ..., Fn for a monitor is all measured. However, the operation gestalt of this invention first compares with received signal level L by the base station under current communication link each received signal level Li (i= 1, 2, .., n) by all the base stations of the control channel numbers F1, F2, ..., Fn for a monitor measured in the 1st measurement period here.

[0021] And measurement processing of each of those received signal levels is performed only for the control channel number for a monitor which had satisfied the conditions of "L<Li" here. In addition, the thing of measurement processing of the received signal level only about the control channel number for a monitor with which were satisfied of this "L<Li" is indicated to be "F more than convention level" by drawing 1 .

[0022] Therefore, according to this operation gestalt, the time amount which selection of the base station which can make it fewer than number n of games of a base station, consequently then serves as a change-over candidate takes the number of the control channels for a monitor which must be made into the measuring object of a received signal level in the measurement period of the 2nd henceforth can be shortened certainly, and can fully suppress fluctuation of the signal level accompanying a change-over of a base station.

[0023] It is the mobile station which is generally in a certain communications area with such migration communication system among the received signal levels from the base station which has n games, and the number of the base stations which show a received signal level higher than received signal level L by the base station under present communication link is [which adjoin the communications area by the base station under present communication link] 2 or 3 so that clearly also from drawing 3 .

[0024] Consequently, when several n of a base station is 20 like the communication system of public business use described above, for example according to the operation gestalt of this invention, in the measurement period of the 2nd henceforth, the time amount which selection of the base station which the number for a monitor of control channels is set to at most 3 from 20, therefore then serves as a change-over candidate takes can fully be shortened.

[0025] Next, other operation gestalten of this invention are explained. First, also in other operation gestalten of this this invention, the point of progressing to circumference zone monitor processing, and this selecting the base station which serves as the next change-over candidate, and starting a channel change-over by migration of the mobile station under communication link etc. is the same as the conventional technique explained by drawing 2 . The point that carry out a deer and other operation gestalten differ from the above-mentioned conventional technique is in the contents of the processing which selects the base station which serves as the next change-over candidate from the received signal level of each base station which equalized by processing in a measurement period and was obtained.

[0026] First, with the conventional technique, as already explained, the received signal level of each base station which equalized by processing in a measurement period and was obtained was seen, and the base station of the communications area which showed the highest received signal level is chosen as a next change-over candidate base station.

[0027] On the other hand, with other operation gestalten of this this invention, only the base station as for which field strength level, i.e., a received signal level, is carrying out the simple increment is

h c g cg b eb cg e e

selected, and, subsequently field strength selects the greatest base station from the measurement processing result in the measurement period of multiple times as a next change-over candidate base station in them.

[0028] with such migration communication system, drawing 3 already explained -- as -- a mobile station 1 -- communications area A2 from -- communications area A3 a circumference zone -- going -- communications area A4 a short time -- moving -- the circumstances at this time -- communications area A3 the direction of a received signal level -- communications area A4 It may become higher than a received signal level.

[0029] in this case -- since only the size of a received signal level is seen with the conventional technique -- communications area A2 from -- once -- communications area A3 the short time after switching -- communications area A4 It will keep as a change-over, therefore, the way things stand, the change of a base station is needed again for a short time, and there is a possibility that a change-over of the base station accompanying migration of a mobile station may take place frequently.

[0030] By the way, it is drawing 3 , for example, the case where the mobile station 1 is moving in the direction of arrow-head P is assumed, and it is communications area A3 in this time. Circumstances and communications area A4 of change of a received signal level It is as follows when it sees about the circumstances of change of a received signal level. first, communications area A3 **** -- the migration direction of a mobile station 1 -- this communications area A3 from -- since it has become in the direction from which it separates, the received signal level by it should show a downward tendency -- it comes out.

[0031] On the other hand, it is communications area A4. Since it has become in the direction which the migration direction of a mobile station 1 enters into it then, and dies, the received signal level by it should show the upward tendency. Then, supposing it selects only the base station as for which the received signal level is carrying out the simple increment at this time, it is communications area A4 in this case. A base station 4, i.e., a base station, is selected. And further, in the base station as for which the received signal level is carrying out the simple increment, supposing a received signal level selects the greatest base station, it will become a base station 4 in this case.

[0032] With other operation gestalten of above-mentioned this invention, only the base station as for which the received signal level is carrying out the simple increment is selected here. Subsequently Since field strength has selected the greatest base station as a next change-over candidate base station in them, for example in the case of this drawing 3 communications area A2 from -- once -- communications area A3 without it switches -- communications area A2 from -- immediately -- communications area A4 It will be switched, therefore a change-over of the unnecessary base station accompanying migration of a mobile station can fully be suppressed.

[Translation done.]

* NOTICES *

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is a timing chart for explaining actuation of 1 operation gestalt of the base station change-over approach of the migration communication system by this invention.
[Drawing 2] It is a timing chart for explaining the base station change-over actuation by the conventional technique.
[Drawing 3] The operation gestalt of this invention is the explanatory view showing an example of the migration communication system made applicable to application.
[Description of Notations]
1 Mobile Station
2-4 Base station
5 Control Station
A1 - A3 Communications area of each base station

[Translation done.]

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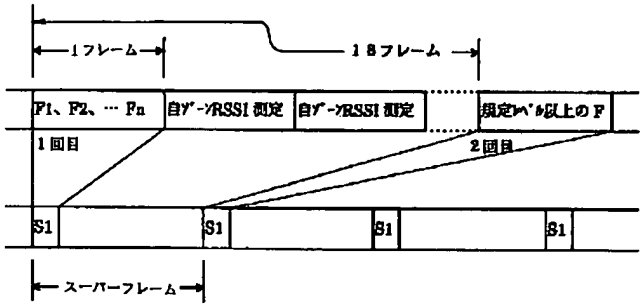
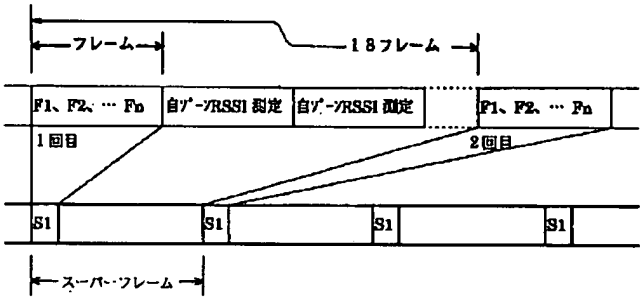
DRAWINGS

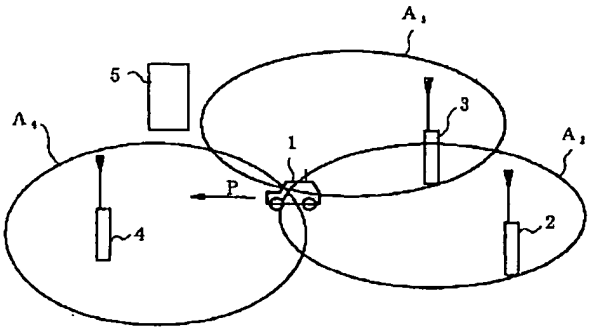
[Drawing 1]
【図1】



[Drawing 2]
【図2】



[Drawing 3]
【図3】



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